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With a Veteran Foreign Observer

Q&A: After Years of R&D Plenty, Why Isn't US No. 1?

Anthony R. Cox has accumulated rare experience as an observer of American science and technology. For the past four and a half years, he was Counsellor for Science and Technology at the British Embassy in Washington, a post that involved contact with research activities and Washington R&D policymakers. Trained as a metallurgist (PhD, Imperial College, London), Cox has extensive experience in defense research, including 1969-71 as an exchange researcher at the US Naval Research Laboratory, Washington. He returned to Britain last week to become a division leader at the National Physical Laboratory, an institution similar to the US National Bureau of Standards. Cox spoke to SGR Editor Greenberg on October 22. Following are excerpts, transcribed and edited by SGR.

Q. What stands out about the American way of science today?

Cox. Over the last four or five years, there's been quite a ramping up of basic research. The big emphasis is that basic research is the way to go. I'm not convinced that it's the way to go.

Q. For industrial prosperity?

Cox. Yes, and competitiveness. The Administration

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says that basic research will provide the ideas and information for new industries, in the same way that you've seen the silicon industry develop in the early years and the bio-sciences that are coming. There's a core of fine work that you do here, but then there's the rest, which doesn't make much difference.

I see enormous new resources going into basic science. But I'm troubled by the fact that when you look back between '75 and '85, when major support also went into basic research, this is where you are now. Why aren't you number one?

Q. We put a lot of value on a large, broadly based research enterprise.

Cox. The marginal impact of a lot of that extra work is very small. It keeps a lot of research scientists busy, and that's always looked up to as a good thing here. I began to look at research here as a kind of parallel to medieval patronage. In the Middle Ages, you had the court poet, whose job was to produce a poem every month and he was paid. I sense scientists expect to be employed, and that as long as they provide a paper, looking beyond

that is sometimes less of a priority.

Q. Is the UK ahead of us in getting a return on spending on research?

Cox. Because of less money, we have to be far more economic in what we do, more directed in picking out the main things which are important. Probably, we're now moving to where you get most research for your money in the UK. This has been our big concern in Europe, that with the big international organizations, not enough attention has been given to getting value out

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In Brief

Heating up again: The perennial issue of returning the National Institute of Mental Health to the National Institutes of Health, where it was until splitting off in 1967 and later becoming part of the Alcohol, Drug Abuse, and Mental Health Administration. The big mental health lobbies are divided, depending on whether they're oriented toward research (70 percent of NIMH's \$350 million this year) or patient service. The parent Department of Health and Human Services is studying the NIMH issue at the request of Senator Orrin Hatch (R-Utah); the American Psychological Association (APA) is planning a study, too.

Meanwhile, a new Director appears to have been selected for the long-vacant post at NIMH: Lewis L. Judd, Chairman of Psychiatry at UC San Diego Medical School. The search, underway for nearly a year, was derailed last spring when 25 professional societies and mental-health lobbies protested that the short list consisted of 11 white male psychiatrists. Judd is a white male psychiatrist, but he came off a new list that contained a few other types.

There's no money around, but no harm in dreaming: Included in the \$9.5-billion NASA authorization bill signed last month by the President: a provision calling for establishment of a National Space Grant College and Fellowship Program.

From the latest 10-year forecast of the Electronic Industries Association: Defense spending "will decline in real terms until well into the next Administration, bottoming out in FY'92 before rising again at about 1 percent a year. Reductions in nuclear weapons will probably take place, but conventional weapons growth will not take place because of those reductions . . . Space will be a leading growth area, and SDI will remain in development through the forecast period."

... Priorities for R&D? Sees No Enthusiasm in US

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of them and changing programs and stopping ones which we think should no longer be continued. The bottom line all the time is that by squeezing the money, better decisions will be made. One senses here that that type of pressure—although it will be denied by everybody who is seeking funds—isn't present to the same extent.

Q. Our politicians and R&D administrators talk a lot about getting more value from research.

Cox. In the US, there's no enthusiasm for that, because you're not pressed to it at the moment. Everybody has confidence in plurality, which is that somewhere, somebody will discover something. That's a luxury which we couldn't afford. It's the argument that we can never be certain whether that scientist or that scientist will get the Nobel Prize, so we have to let them all have a go at it. In the UK, we're a little bit more discriminating. We can't afford that.

Q. But it's worked out reasonably well: somewhere someone does discover something.

Cox. When you hear companies talk about how they have to allocate their resources, they say they have to face up to a given size cake in their research budget and they have to make decisions. You've got successful companies who have introduced new products by this route, and why shouldn't it apply in a broader context of government spending?

International Collaboration

Q. We hear complaints from other nations about US government security restrictions and foot dragging on international collaboration in some fields of research.

Cox. At the moment the Americans still consider that they can afford to do most things on their own. And this is very understandable. If Congress is going to give you the money, why have all the problems of having international people get involved, having to consider them and arguing about who does what, and get into problems of coping with technology transfer? I think the technology transfer issue is grossly over-exaggerated, but it's become a concern in even the most fundamental programs. But I think you're going to have to come to terms with the fact—which will happen in a few years time—that you can't afford all these programs, that you can't afford the human genome, you can't afford the trans-atmospheric spaceplane, the Superconducting Super Collider, the space program. You haven't got there yet, though.

Q. Are we approaching it?

Cox. I think so. I don't think you're going to come to terms in the next two years but the next Administration

will have to face it. In Europe, we've all been a little disappointed that we haven't made more progress on the space station program that was originally proposed by the President. This is going to be an enormous venture, with extremely high operating costs, and it's something we looked at pretty closely. I sense now that Europe—certainly the UK—is very hardnosed in looking at the bottom line, and is becoming quite concerned we might have to spend our money in other directions, not just thinking of short-term benefits, but the long-term benefits, 10 to 15 years. We may get more by spending our money on molecular sciences, biosciences than by spending it in space.

Q. Do you sense a reduction in openness of American R&D?

Cox. Over the last four years, there's been a general concern over the availability of scientific information. My own view is that the concerns have been overexaggerated. There's two aspects to this: the international competitive angle. I'm thinking here of your concerns over the Japanese. And there's the Eastern-bloc countries and the effect on the military balance. I think both are overexaggerated. If we think of the competitiveness angle, I'm not conscious that American basic research has been the building blocks of Japanese success. People often emphasize that X hundred foreign people are working at NIH and the tremendous benefits they get from that. I make the point that to have those high-quality brains working in this country is of mutual benefit. You get people in a very, very creative part of their lives contributing to American science.

On the technology transfer issue, I have reservations, again. It's interesting that we have, shall we say, an American university down the road, industry at the other end of the street. And what's the most difficult thing you find to do? Transferring the technology from the university and getting it commercially exploited over 100 yards. And there's someone turning around and saying that the Soviets, a bureaucratic country—and we

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... Access to Meetings Easy, If You Know the Ropes

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know that bureaucracies are not the best things to move information and exploit it in risky environments—are in fact taking it and exploiting it.

Q. Nonetheless, there is great concern here that we are contributing to the strength of our rivals.

Cox. I'd like to see more evidence. I haven't seen anything that convinces me of that. Take the superconductivity conference [last July, in Washington, on commercialization, from which foreigners were excluded]. I think people very quickly forget that superconductivity was discovered in an IBM laboratory in Zurich on a French material. The conference was set up by the National Science Foundation, the White House Science Office, and the Department of Energy. I do look upon it as a bit of an aberration. It was there as a ginger group [an energizing force] for American industry, to say, "Fellows, get off your backsides." I think it was a response to press jibes that the Japanese were going to win again, fueled by the scientists who were happy to see an injection of more funds.

There were lots of conferences open to us. Only three or four weeks after that, the State Department held another conference on high-temperature superconductivity, with Edward Teller there, and everybody was invited. So, I don't look upon [the July conference on commercialization] as a precedent.

Indiscriminate Security

Q. Before the superconductivity episode, there were many complaints about a tightening of access to conferences that previously were open to foreign scientists—in materials, for example.

Cox. I've never been refused admission to a conference. I've been to conferences where there have been restrictions and closed sessions. But there are procedures which you can go through. You just apply in good time. We've always got in. It hasn't been a significant problem, once you know the procedures to go through. Having said that, I was at a conference several weeks ago. There were quite a number of publications outside and I picked them up, and on them they had the caveat that these were controlled by the Export Administration Act, etc., and to supply these to foreigners was likely to mean that there would be some penalties.

And when I ran through them, they were the type of things I could have written from the normal literature. It's the lack of discrimination that concerns me. I sensed that it has swung a little bit too far, that people would even consider restricting it.

Q. Our scientists often fret about the decision-making

system that's evolved here for supporting R&D.

Cox. The system you've got makes it very difficult to prioritize. Everything is fine on an increasing budget, because no one has to make any hard decisions. It's not that they don't have to; it's very difficult to get decisions through the system. If the Administration makes a decision to reduce NIH's budget, one doesn't sense that it's for prioritizing; it's just because they know that the Congress is going to give NIH more money. When the Administration tried to cut out the Advanced Communication Satellite, or it's tried to cut down on other things, for what may have been quite good reasons, the lobbyists have come in and changed the thing. That makes management extremely difficult.

I'm also concerned when I see the kind of line-item commentaries that come out of the [Congressional] authorization committees. The conditions that they are setting on the agencies makes policymaking extremely difficult. I find it difficult here to see consistent themes running through and being held. People say, "This is the democratic system, what could you want more? This is politics working, it's much more than just picking the priority between A, B, and C." Rarely do I see coherent policy.

Q. Do you see any mechanism in place for a period when we will have to decide that we can't do some things simply because we can't afford them?

Cox. You've got a mechanism in place, Gramm-Rudman-Hollings. But that's a blunt club. I've got no feeling that you will be able to resolve it without the blunt club. I see nothing that gives me any kind of confidence that you're going to really identify priorities and say, "Well, those are things that we are going to have to do, and those are things we're going to have to stop." Because, the way the programs grow, you see SDI programs—all states get something; you see the 600-ship Navy—everybody with a dockyard; everybody with a federal lab. It goes back to the states, and then it becomes very difficult politically to give up things. I'm not optimistic that you will be able to do it in a rational fashion, even if the Administration proposes it, which I don't sense it's going to do now that you're coming up to an election. I think you're going to have a very uncertain period over the next two or three years.

Q. Maybe repeat the experience of the UK, where you went from a period of relative affluence and growth in science and technology to sudden budget cuts and closings of laboratories and programs?

Cox. That has to be the solution in the long term. One moves on slippery ground in talking about federal laboratories. You continually hear that many of them have

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... Agriculture, Energy Cuts Can Aid Other Fields

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accomplished the missions for which they were set up. Then they found new activities. I suppose one should judge in a kind of a national sense whether these are the activities we want to fund or whether we should look elsewhere. You've got \$15 to \$18 billion a year in that [national laboratories].

In the UK, we're saying if we want to increase research in the physical sciences, we're going to have to recognize that we've been so successful in agriculture that this is a period where we could reduce agricultural research. The other one is energy research. Is it necessary, when we've got good supplies of fossil fuels, to carry on with these big nuclear research programs? When you've reached that stage, then you're going to have to grasp that one.

We've had the problem in Europe. How long should CERN [the high-energy physics European Center for Nuclear Research] go on? Does it have an infinite life? At what stage do you decide to stop spending money on CERN?

Q. If you're going to stay in particle physics, you have to spend money on CERN.

Cox. In the UK, we were spending about 25 percent of our Science and Engineering Research Council budget on high-energy physics. We're saying that's too much. We're going to bring that down to 10 percent. If the same type of decision were taken in Europe, that they want to move into other areas, then CERN would have to carry on doing interesting work, but the level at which it does it might be not be growing at the same rate.

Q. Has the US been facing up to reality with the SSC, or is this still never-never land where we can have it all?

Cox. The way the Administration sees the future is having trained people doing high-quality work on the edge of basic science. It's a very expensive way of doing it. There might be other ways of achieving a very similar result. That's the way the UK is looking upon it. We can provide highly trained personnel in the biosciences areas, where enormous growth is seen.

Q. The government here has started several programs aimed at closer relations between science and industry.

Cox. There have been NSF's Engineering Research Centers (ERC), the Small Business Innovation Research Program. Whenever there's an initiative here, I get requests from London within a few days, "Please tell us how far this has gone and assess it." And I have to point out that they're only talking about it and it will be another five years before you can actually judge the results. Even on the ERCs, yourselves you say it will take three or four years before you can look at them. Again, my fear on them is that it is a step in the right direction, but it's going to be a very modest one in its overall effect because these multidisciplinary research

centers only account for a small proportion of the university research budgets.

The Small Business Innovation Research Program has been an interesting one to us. In fact, we set up our own model following in a very similar line as a result of what we saw when we visited companies that were growing out of this. I think the SBIRs do form a very useful kind of bridging, especially for those small companies. We hear a lot about venture capital companies, but they're reluctant to come in when they're that small.

Q. What will you be doing in your job at the National Physical Laboratory?

Cox. I'll be trying to align programs more closely with industrial needs and encouraging our scientists to show their wares and display relevance.

Upswing Noted in Academic Jobs

The graying of American academe has been opening up new faculty posts for recent PhDs, thus ending in many fields a long-standing tight job market, according to a new report issued by the National Science Foundation. NSF also notes that a big chunk of faculty will reach retirement age during the next five years, especially in civil and electrical engineering, physics, mathematics, and economics.

"Between 1980 and 1986," the NSF report states, "the proportion of full-time recent doctorate faculty increased in [all the major] engineering fields," while many fields of science also took on recent PhDs to fill faculty posts.

"Reversing a long-time trend," NSF notes, "the proportion of faculty who received their doctorate within the last seven years increased or remained constant in 11 science/engineering fields between 1980 and 1986." During those years, the report continues, the proportion of faculty 60 and over increased in almost all fields—from 6 to 8 percent in the 60-64 range, with ages 60 and older totaling 16 percent in aeronautical engineering, 15 percent in physics, and 11 percent in industrial engineering.

A high proportion of the new faculty appointees were foreign-born and trained. These included thirty-nine percent of assistant professors in 1986 in electrical engineering, 36 percent in computer science, and 30 percent in chemical engineering.

The data and analysis are contained in NSF Highlights Report No. 87-13, *Recent Doctorate Faculty Increase in Engineering and Some Science Fields* (6 pages), available without charge from NSF, Division of Science Resources Studies, 1800 G St. NW, Washington, DC 20550; tel. 202/634-4787.

Big Shifts in Staff at White House Science Office

In the 13 months since William R. Graham became Director of the White House Office of Science and Technology Policy (OSTP), extensive staff changes there have strengthened the military presence in the office and added a bit of Republican political background. But, even in the waning days of the Administration, OSTP remains an attractive way station for policy-minded scientists and engineers, and Graham is not suffering from a dearth of professionally trained, experienced staff.

What he's suffering from is an obsession for cloaking

OSTP's previously open style of operations in furtive tactics that have become a puzzlement in Washington science-policy circles. Thus, Graham has guarded his staff list like a pre-Gorbachev *apparatchik*, though previous OSTP regimes have routinely provided staff information upon request.

SGR's efforts to obtain the list (reported here October 15) brought sympathetic comment from elsewhere in the capital. A staff member for a Senate subcommittee responsible for R&D matters volunteered that he

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The Staff Roster at the Center of Presidential Science Advice

Following is the staff roster, with dates of appointment and brief background data, of the White House Office of Science and Technology Policy, supplied to SGR by OSTP and stated to be current as of October 21.

William R. Graham, Director, Oct. 1986; PhD, Stanford (electrical engineering); founder and senior executive, R&D Associates; Air Force Weapons Research Laboratory; Chairman, General Advisory Committee on Arms Control and Disarmament, Arms Control and Disarmament Agency.

Thomas P. Rona, Deputy Director, Dec. 1986; ScD, MIT (electrical engineering); Boeing Aerospace, DOD Deputy Director Space and Intelligence Policy; Special Asst. for C3I/Space Policy.

R. Joseph DeSutter, Lt. Col., USAF, Military Asst. to the Director, Dec. 1986; PhD, USC (international relations); various Air Force staff positions, including Command Executive Officer, AF Space and Missile Systems Organization.

Michael P. Marks, Asst. Director for Global Technology, Nov. 1986; MA, U. of Pittsburgh (international affairs); Legislative Asst. to Sen. Jake Garn (R-Utah); Asst., Office of Under Secretary of State for Security Assistance, Science and Technology (1981-86).

Deborah Wince, Asst. Director for International Affairs, Dec. 1984; MA, Cambridge (classical archeology); NSF Program Manager for Eastern European Cooperative Science Programs.

Beverly J. Berger, Asst. Director for Life Sciences, April 1987; PhD, UC Davis (population genetics); Director, Dept. of Energy Biomass Energy Research Program, Lawrence Livermore National Lab.

Michelle K. Van Cleve, Asst. Director for National Security Policy, Aug. 1987; JD (USC); staff of Rep. Jack Kemp (R-NY); Republican Platform Committee Staff, 1984; staff attorney, 1981 Presidential Inaugural Committee.

Frances C. Li, Senior Policy Analyst, Aug. 1986; PhD, Cornell (linguistics); Defense Language Inst.; Agency for International Development, program analyst.

Thomas J. Bishop, Lt. Col., USAF, Military Asst. and Senior Policy Analyst, July 1987; MBA, U. of Utah (quantitative analysis); pilot, instructor, FB-111; Joint Chiefs of

Staff, policy planning.

Jack B. Wood, Col., US Army, Senior Policy Analyst, May 1986; West Point; MA, Princeton (mechanical engineering); battalion commander, West Germany; Asst. Prof. Mechanical Engineering, West Point.

William T. Oosterhuis, Senior Policy Analyst, July 1986; (on sick leave); high-energy physics, on detail from NSF.

Alvin Lee Young, USAF officer, Senior Policy Analyst for Life Sciences, Jan. 1984; PhD, Kansas State Univ. (agronomy); researcher with Operation RANCH HAND defoliation program, Vietnam; faculty, AF Academy, AF School of Aerospace Medicine.

Mary Martin Gant, Senior Policy Analyst and Executive Secretary, Biotechnology Science Coordinating Committee, May 1983; MS, Northwestern Univ. (mathematics); DOE Office of Energy Research.

Kathleen Bernard, Senior Policy Analyst, Sept. 1987; BS, Univ. of S. Carolina (mathematics), serving as Fellow of the American Electronics Association; formerly with Cray Research, Boeing Computer Services.

David Beecham, Senior Policy Analyst, Sept. 1987; PhD, Birmingham Univ., UK (electrical engineering); Fellow of the American Electronics Association; Bell Labs.

William A. Owczarski, Senior Policy Analyst, Sept. 1987; PhD, Rensselaer Polytechnic Inst. (metallurgical engineering); Fellow of the Industrial Research Institute; Pratt & Whitney (for 25 years), previously with GE.

Thomas D. Gillespie, Senior Policy Analyst, Aug. 1987; PhD, Pennsylvania State (mechanical engineering); one-year appointment from Univ. of Michigan Transportation Research Institute.

Steven D. Harrison, Major, US Army, Policy Analyst; PhD, Rensselaer Polytechnic Inst. (nuclear engineering); asst. prof. physics, West Point; holds joint appt. with Radiation Directorate, Defense Nuclear Agency.

Jonathan F. Thompson, Executive Assistant to the Science Adviser, October 1986; BA, Univ. of Wisconsin; served as Executive Asst. to Graham at NASA (where Graham was briefly Acting Administrator), and with White House Office of Presidential Personnel.

Mary Catherine English, Director of Public Affairs, December 1986; St. Mary-of-the-Woods College, Indiana; 1980 Reagan-Bush Campaign staff, White House press office.

... Reliance on Military Officers, Borrowed Staff

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hadn't had any better luck. The same experience was reported by a senior staffer for a research organization that has extensive dealings with OSTP and that would find it useful to know who works there and on what.

Taking the Freedom of Information route, SGR's request for staff information, mailed on August 28, drew a blank until it became the subject of discussion between SGR's lawyer and the General Counsel of the White House Office of Administration, which sets Freedom of Information policy for Executive Office staff. OSTP finally mailed out the sought-after information on October 21, a day after sending a letter stating that OSTP "is experiencing a shortage of administrative staff."

In any case, since Graham was confirmed for the post on October 1, 1986, 13 professional members have departed from the staff, which in recent years has generally numbered about 20 professionals. And Graham has appointed 10 professionals, bringing the current total to 18. As in the past, a substantial proportion of the OSTP staff consists of specialists borrowed from federal research agencies, military officers on detail, and scientists and engineers on fellowships, usually from professional societies. Perhaps more so than any other presidential office, OSTP has become a pick-up team, with lots of comings and goings, and no tradition of permanent staff. The longest-serving professional member arrived in 1983.

Whether by design or the convenience of availability, the current staff has a far stronger background in national security affairs than its predecessors. But that may not be out of order, given that some 75 percent of federal R&D expenditures are for national security. Graham's professional background is in nuclear weapons research and arms control; his Deputy, Thomas P. Rona, came out of Boeing Aerospace and the Pentagon, where he was Deputy Director for Space and Intelligence Policy. And five of the 18 professional staff members are active duty military officers.

Partisan political background is more pronounced than in recent years, but there is ample precedent for politics in the supposedly pristine White House Science Office. John F. Kennedy's Science Adviser, Jerome Wiesner, was active in Kennedy's campaign. In the 1964 presidential campaign, the Science Office served as a staging area for Democratic scientists working for President Lyndon Johnson. Since then, however, brand-name politics has either been subdued or non-existent. But the bios of Graham's crew shows a change, though there's nothing to suggest that politics is flavoring their science policy.

In the 1980 campaign, Graham served on Reagan's

Defense Policy Advisory Board and was a member of President-elect's defense transition team. Mary Catherine English, OSTP Director of Public Affairs, was a staffer in the 1980 Reagan-Bush campaign. Michael B. Marks, Assistant Director for Global Technology, was Legislative Assistant to Senator Jake Garn (R-Utah) from 1979-81, before going to the State Department when the Reagan Administration took office. Michelle K. Van Cleve, Assistant Director for National Security Policy, worked for Rep. Jack Kemp (R-NY) from 1981-87 while simultaneously serving as an assistant with the House Republican Conference. —DSG

In Print

Japanese Technical Information: Opportunities to Improve US Access (CRS No. 87-818 S; 55 pp.), report by the Congressional Research Service, Library of Congress, says a major return in "avoided costs of unnecessary R&D" could be reaped from more extensive translation and distribution programs, tax incentives for private firms to collect Japanese literature, expanded language training, etc. The report, by Christopher T. Hill, CRS Senior Specialist in Science and Technology Policy, notes that "Other countries, and especially Japan, are well known for their aggressive pursuit of scientific and technical information from other countries." But "In the United States, foreign travel is often viewed as a 'junket' or vacation in disguise, rather than as an opportunity to study and to transfer technology from abroad."

Congressional Research Service reports are available to the public only through members of Congress, who usually oblige requests for copies (there's no charge). Specify that it's a CRS report and give full title and CRS number.

Health Risk Analysis: Technical Adequacy in Three Selected Cases (GAO/PEMD-87-14, 171 pp.), report by the General Accounting Office, requested by the House Science, Space, and Technology Committee, concludes that "risk assessment work was generally adequate" at the Food and Drug Administration and the Occupational Health and Safety Administration, but that "serious problems" exist in risk management programs at these agencies and the Environmental Protection Agency.

The report is available without charge from US General Accounting Office, PO Box 6015, Gaithersburg, Md.; tel. 202/275-6241.

Developments in School Mathematics Education Around the World (Stock No. 386; 725 pp.), proceedings
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In Print: Math Ed, Med Schools, ICSU, R&D Who's Who

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of the International Conference on Mathematics Education, March 1985, sponsored by the University of Chicago School Mathematics Project. A major event in math education, the conference produced a unique collection of reports on math-education research, curricula, and classroom experience in over a dozen nations. If you're interested in the subject, this one's a must.

Available for \$20 from National Council of Teachers of Mathematics, 1906 Association Drive, Reston, Va. 22091; tel. 703/620-9840.

Prevention '86/'87: Federal Programs and Progress (192 pp.), report from the Office of Disease Prevention and Health Promotion, US Department of Health and Human Services, on progress toward 1990 health goals, which the Office has kept pursuing, despite the ill will of the Reagan budget managers. Contains data on federal health programs and their budgets, vital statistics, dietary trends, alcohol and tobacco consumption, etc.

Available for \$3 from National Health Information Center, PO Box 1133, Washington, DC 20013-1133; tel. 800/336-4797 or 301/565-4167.

Assessing the Outcome of Affirmative Action in Medical Schools: A Study of the Class of 1975 (RAND/R-3481-CWF; 47 pp.), report by the RAND Corp., financed by the Commonwealth Fund, found that minority members in group studied were "practicing in physician-shortage areas at twice the rate of their non-minority counterparts"; also they were "caring for significantly greater proportions of ethnic minority patients and patients supported by Medicare." Conclusion: "Although affirmative action in medical education has not reached certain important goals, there is no question of its overall success."

Available for \$4 from RAND Corp., Publications Dept., 2100 M St. NW, Washington, DC 20037. (No telephone orders.)

Science International (formerly ICSU Newsletter), revamped quarterly publication (16 pp.) of the International Council of Scientific Unions, contains news of ICSU's member organizations, meeting schedules, and publications of the ICSU Press. The brightened-up newsletter grows out of a 1985 policy decision for ICSU "to raise its visibility not only among scientists but also among decision makers and the general public."

Available without charge from ICSU, Science International, 51, Bd. de Montmorency, 75016, Paris, France; tel. 45 25 03 29.

Energy & Nuclear Sciences International Who's Who (second edition, 388 pp.) lists 3000 scientists and engi-

neers in 90 countries, with professional data, addresses, etc.

Available for \$345 from Gale Research Co., Book Tower, Detroit, Mich. 48226; tel. 313/961-2242.

Job Changes and Appointments

W. Maxwell Cowan, from Provost, Washington University, St. Louis, to Chief Scientific Officer and Vice President, Howard Hughes Medical Institute.

Thomas E. Lovejoy, from Executive Vice President, World Wildlife Fund, to the newly created position of Assistant Secretary for External Affairs, Smithsonian Institution, with responsibilities including fundraising from private sources.

Charles Fentress, veteran Director of Public Relations, Association of American Medical Colleges, to partner and head of the Washington office, the Wussow Consulting Group, a Tennessee-based firm specializing in healthcare marketing and communications, effective January 1.

Order "The Grant Swinger Papers"

Available from SGR: *The Grant Swinger Papers*, by and about the mythical Director of the non-existent Center for the Absorption of Federal Funds. These prophetic writings, 32 pp., by SGR Editor Greenberg, originally appeared in *Science*, *The Washington Post*, *The New England Journal of Medicine*, and SGR. Included are "Overhead and Underhand: The Economics of Academic Research," "Let's Hold a Conference," "Questions and Answers with Grant Swinger," and "Dear Applicant: Sorry, Grant Swinger Got Here First."

The collection is inexplicably underpriced at \$4.95 per copy (add \$2 for overseas airmail.) Please send payment with order. SGR, PO Box 6226, Washington, DC 20015.

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In Wash., D.C.: 785-5054

Science Publishing: Revivals and a 1st Anniversary

There are rumblings of life in the graveyard of pop science magazines, a genre that flew high in the early 1980s and then crashed in a thin ad market.

Science Digest, the old Hearst monthly that went out of business last year, is being revived as a no-frills reprint operation by Family Media, the New York publishing firm that now publishes *Discover*, formerly owned by Time Inc. The resurrected *Science Digest* will revert to the five-by-seven-inch format that it long occupied before it went full-size in prosperous days. And it will truly be a digest—only reprinting material from other publications. The editor is Frank Kendig, a veteran science writer and editor who once edited *Omni*, a Penthouse property that mixes science, science fiction, and startling graphics. First off in the boom, *Omni* is the only pop science-type magazine that appears to have thrived continually.

Under its new owner, *Discover* looks a little less slick and a lot less expensive to produce, which may explain how Family Media expects to make a go of it after high-overhead Time Inc. decided to call it quits. *Science Digest* is planned as a low-budget enterprise for an on-the-run market different from the *Discover* audience.

Family Media, which has prospered on sports and homemaking magazines, thus is the lone occupant of a publishing field deemed important, but abandoned, by the scientific community—science for laymen.

Time Inc. got a bargain deal last year when the panicky chiefs of the American Association for the Advancement of Science sold their editorially strong but financially wobbly *Science86* for some \$6 million (SGR August 1, 1986: "Did This Magazine Have to Die?"). Within a week, Hearst sold *Science Digest* to Time for an undisclosed sum (probably under \$2 million). *Discover* absorbed the subscribers of the two acquisitions, and then was sold to Family Media for some \$26 million. Business skill has never been a

strong point at the venerable AAAS.

Meanwhile, *The Scientist*, the every-other-week "first newspaper for science professionals," has completed its first year of publication. Produced by the Institute for Scientific Information, the Washington-based tabloid has definitely been on the upswing in editorial quality, journalistic enterprise, and worldwide extent of coverage.

Advertising, however, remains sparse, and circulation, about 30,000 per issue, is predominantly giveaways to subscribers to ISI's *Current Contents*, the pioneering retrieval guide to the world's scholarly literature. A new business staff was hired for *The Scientist* in September and a major campaign for ads and paid circulation is in the works.

Whatever the outcome, the tabloid is considered to have great staying power. It is a passion project of ISI's affluent founder and President, Eugene Garfield. He serves as the publisher and editor-and-chief and his portrait and lengthy commentaries, on innumerable aspects of information science, are contained in each issue. (As A.J. Liebling said, freedom of the press belongs to him who owns one.)

Finally, there's *Issues in Science and Technology*, the dreadfully serious quarterly of the National Academy of Sciences. About to be interred last year, it was given a last-minute reprieve and a new editor, Steve Marcus, formerly of the MIT *Technology Review* and various other publications. Thanks to the Academy's money-pulling prowess, the gifts, though not subscriptions, have been rolling in. The University of California has provided \$150,000 a year for three years. DuPont and Monsanto have each kicked in \$50,000, the University of Texas donated \$25,000. The Weingart Foundation, of California, a past donor of \$100,000, has contributed another \$100,000. Somewhat overdue, the fall issue, first under the new editorial regime, is due to appear soon.

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